

WHAT IS CLAIMED IS:

1. A thermal image identification system, comprising:
an infrared emitting element comprising a laminate, the laminate comprising:
an infrared emitting layer having a first side and a second side;
a cover layer associated with the first side; and
a backing layer associated with the second side; and
a power source electrically communicable with the infrared emitting element.
2. The thermal image identification system of claim 1, wherein the infrared emitting layer comprises:
a support having a first surface and a second surface;
a first plurality of conductive elements disposed on the first surface; and
a first layer of electrically conductive heating material disposed on the first plurality of conductive elements.
3. The thermal image identification system of claim 2, wherein the support and the first plurality of conductive elements are formed from a flexible circuit board.
4. The thermal image identification system of claim 2, wherein the support comprises an insulating material.
5. The thermal image identification system of claim 2, wherein the first layer of electrically conductive heating material is secured to the first plurality of conductive elements with a conductive adhesive.

6. The thermal image identification system of claim 2, wherein the first plurality of conductive elements comprises electrodes.

7. The thermal image identification system of claim 2, wherein the first layer of electrically conductive heating material is formed in a shape comprising at least one of a geometric shape, a symbol, and an alphanumeric character.

8. The thermal image identification system of claim 2, wherein the infrared emitting layer further comprises:

a second plurality of conductive elements disposed on the second surface; and

a second layer of electrically conductive heating material disposed on the second plurality of conductive elements.

9. The thermal image identification system of claim 8, wherein the support, the first plurality of conductive elements, and the second plurality of conductive elements are formed from a flexible circuit board.

10. The thermal image identification system of claim 8, wherein the first and second layers of electrically conductive heating material are secured to the first and second pluralities of conductive elements, respectively, with a conductive adhesive.

11. The thermal image identification system of claim 8, wherein the first and second pluralities of conductive elements comprise electrodes.

12. The thermal image identification system of claim 8, wherein the electrically conductive heating material comprises a plastic film.

13. The thermal image identification system of claim 1, wherein the infrared emitting layer comprises:

a support having a first surface and a second surface; and
at least one resistive element disposed on the first surface.

14. The thermal image identification system of claim 13, further comprising a heat dispersion material disposed on the at least one resistive element.

15. The thermal image identification system of claim 14, wherein the heat dispersion material is electrically insulated from the at least one resistive element.

16. The thermal image identification system of claim 15, wherein the heat dispersion material is secured to the at least one resistive element with a non-conductive adhesive.

17. The thermal image identification system of claim 14, wherein the heat dispersion material is formed from a material having a high heat conductance.

18. The thermal image identification system of claim 17, wherein the heat dispersion material is formed from a material having a high infrared emissivity.

19. The thermal image identification system of claim 18, wherein the heat dispersion material comprises at least one of metal film, paint, and ink.

20. The thermal image identification system of claim 13, wherein the support and the at least one resistive element are formed from a flexible circuit board.

21. The thermal image identification system of claim 13, wherein the support comprises an insulating material.

22. The thermal image identification system of claim 13, wherein the at least one resistive element comprises a wire.

23. The thermal image identification system of claim 22, wherein the wire comprises a nickel-chromium alloy.

24. The thermal image identification system of claim 13, wherein the at least one resistive element comprises at least one of paste filled with metal particles, paste filled with carbon particles, ink filled with metal particles, ink filled with carbon particles, and metal film.

25. The thermal image identification system of claim 13, wherein the at least one resistive element is arranged on the support to form a shape comprising at least one of a geometric shape, a symbol, and an alphanumeric character.

26. The thermal image identification system of claim 1, wherein the cover layer is secured to the first side of the infrared emitting layer with non-conductive adhesive.

27. The thermal image identification system of claim 26, wherein the cover comprises an infrared transparent material.

28. The thermal image identification system of claim 1, wherein the backing layer is secured to the second side of the infrared emitting layer with non-conductive adhesive.

29. The thermal image identification system of claim 1, wherein the backing layer comprises at least one of a chemical fastener, a magnetic fastener, and a mechanical fastener.

30. The thermal image identification system of claim 1, further comprising a first heat insulating layer between the infrared emitting layer and the cover layer.

31. The thermal image identification system of claim 30, further comprising a second heat insulating layer between the infrared emitting layer and the backing layer.

32. The thermal image identification system of claim 31, wherein the first and second heat insulating layers comprise an infrared transparent material.

33. The thermal image identification system of claim 32, wherein the infrared transparent material comprises a bubble-filled plastic film.

34. The thermal image identification system of claim 1, further comprising an infrared reflective layer between the second heat insulating layer and the backing layer.

35. The thermal image identification system of claim 34, wherein the infrared reflective layer comprises a metallized plastic film.

36. The thermal image identification system of claim 34, wherein the infrared reflective layer comprises a metallic coating on the second heat insulating layer.

37. The thermal image identification system of claim 1, further comprising a sealing layer substantially covering edge portions of the infrared emitting element.

38. The thermal image identification system of claim 1, wherein the power source comprises at least one battery.

39. The thermal image identification system of claim 1, further comprising:
a first connector;
at least one first conductor electrically communicating the infrared emitting element with the first connector;
a second connector engageable with the first connector; and
at least one second conductor electrically communicating the power source with the second connector.

40. The thermal image identification system of claim 1, further comprising a controller electrically communicating with the power source and with the infrared emitting element.

41. The thermal image identification system of claim 40, wherein the controller regulates at least one of an activation of the infrared emitting element, an illumination intensity of the infrared emitting element, a duration of a pulse of the infrared emitting element, a temperature of the infrared emitting element, and a voltage of the power source.

42. The thermal image identification system of claim 40, further comprising a switch electrically communicating with the controller, wherein the controller generates a control signal in response to actuation of the switch.

43. The thermal image identification system of claim 40, further comprising a control port electrically communicating with the controller, wherein the controller generates a control signal in response to an electric signal received through the control port.

44. The thermal image identification system of claim 40, further comprising a receiver electrically communicating with the controller, wherein the controller generates a control signal in response to an input signal received by the receiver.

45. The thermal image identification system of claim 44, wherein the receiver comprises at least one of an infrared receiver and a radio frequency receiver.

46. The thermal image identification system of claim 40, further comprising a temperature sensor electrically communicating with the controller, wherein the controller generates a control signal based on a measurement made by the temperature sensor.

47. The thermal image identification system of claim 1, further comprising a plurality of infrared emitting elements arranged contiguously for coordinated operation.

48. The thermal image identification system of claim 47, wherein the infrared emitting elements are arranged in a one-dimensional array.

49. The thermal image identification system of claim 47, wherein the infrared emitting elements are arranged in a two-dimensional array.

50. The thermal image identification system of claim 47, further comprising a controller electrically communicating with the power source and with the plurality of infrared emitting elements.

51. The thermal image identification system of claim 50, wherein the controller regulates at least one of an operating mode of the infrared emitting elements, an illumination intensity of the infrared emitting elements, a temperature of the infrared emitting elements, and a voltage of the power source.

52. The thermal image identification system of claim 51, wherein the operating mode comprises at least one of an on mode, an off mode, a pulsing mode, a sequential lighting mode, and a pattern display mode.

53. The thermal image identification system of claim 52, wherein the pattern comprises at least one of a geometric shape, a symbol, and an alphanumeric character.

54. The thermal image identification system of claim 1, wherein communicating the power source with the infrared emitting element causes the infrared emitting element to generate infrared energy.

55. The thermal image identification system of claim 54, wherein the infrared energy has a wavelength above 2 μm .

56. The thermal image identification system of claim 55, wherein the infrared energy has a wavelength in a range between 3 and 14 μm .

57. A method of marking a target, the method comprising:
providing a thermal image identification system, comprising:
an infrared emitting element comprising a laminate, the laminate comprising:
an infrared emitting layer having a first side and a second side;
a cover layer associated with the first side; and
a backing layer associated with the second side; and
a power source electrically communicable with the infrared emitting element;
securing the infrared emitting element to a target; and
activating the infrared emitting element to generate infrared radiation.